

ARISE - C-130 Hercules 09/21/14 Science Report

Aircraft:

[C-130H Hercules #439](#) ([See full schedule](#))

Date:

Sunday, September 21, 2014

Mission:

ARISE

Mission Location:

Arctic Ocean

Mission Summary:

Sea Ice and Radiation - Flt #14

Today's flight targeted the eastern side of the sea ice 'tongue' extending to the south towards the Alaskan/Canadian coasts. The planned flight pattern was near 73.3N, 130.6W near the sea ice/open ocean edge west of Banks Island. The planned pattern was very close to the region flown on the previous flight (19Sept2014). The primary objectives included a clear sky spectral and broadband albedo characterization coincident with the Terra overpass, a characterization of the sea ice-to-open ocean surface and radiative flux gradient, and the characterization of radiative/microphysical properties of low stratus clouds over the sea ice-to-open ocean surface gradient. The conditions were too cloudy for the albedo experiment but some good data were obtained in broken cloud conditions by LVIS to characterize the sea ice over part of the area. Two cloud decks were sampled. The first was low altitude stratus deck on the eastern side of planned pattern over the sea-ice towards Banks Island. The cloud tops were found to be about 1600 ft. The C-130 was unable to penetrate the cloud bases which were below 500 ft. The ocean just to the southeast of this area had cleared, and on one of the legs, a series of pitch/roll maneuvers were performed for LVIS calibration. An extensive, colder low cloud deck was identified by satellite to occur just north of the target area. This cloud deck appeared in satellite data to envelope a huge area over the arctic on this day. The ground team directed the aircraft toward the southern end of this deck to investigate and sample. These clouds were found to be mostly multilayered, with the upper layer cloud boundaries near 4200-5200 ft (tops) and 3400 ft (bases). The tops of the lower deck were just above 1500 ft and the bases appeared to be stuck to/near the surface since the C-130 was unable to penetrate at 500 ft. The lower deck appeared to have eroded away in some areas beneath the upper deck. For both cloud areas that were sampled, radiative properties were obtained close to the surface at altitudes of 500-1000 ft, as well as above the cloud tops. In addition, stair-step patterns were executed to porpoise thru the clouds to obtain microphysical information and flux profiles. No mid-level clouds or cirrus were present overhead. There were numerous coincident satellite overpasses and all of the instruments were reported to work well.

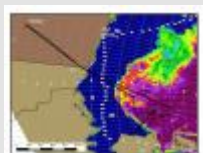
Images:

September 21, 2014 Figure 1



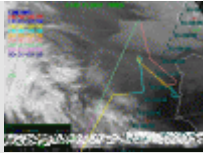
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September 21, 2014 Figure 2



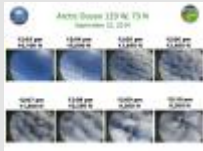
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September 21, 2014 Figure 3



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Submitted by:

William L. Smith Jr. on 09/22/14

Related Flight Report:

C-130 Hercules 09/21/14 - 09/22/14

Flight Number:

Sea Ice & Radiation - Flight #14

Payload Configuration:

ARISE

Nav Data Collected:

Yes

Total Flight Time:

8.2 hours

Submitted by:

Luci Crittenden on 09/21/14

Flight Segments:

From:	PAEI	To:	PAEI
Start:	09/21/14 16:50 Z	Finish:	09/22/14 01:00 Z
Flight Time:	8.2 hours		
Log Number:	141002	PI:	Christy Hansen
Funding Source:	Bruce Tagg - NASA - SMD - ESD Airborne Science Program		
Purpose of Flight:	Science		

Flight Hour Summary:

	141002	151004
Flight Hours Approved in SOFRS	229	
Flight Hours Previously Approved		88.7
Total Used	140.3	18.2
Total Remaining		70.5

151004 Flight Reports

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
10/02/14 - 10/03/14	Cal Flight	Science	8.6	8.6	80.1
10/04/14	Transit	Transit	9.6	18.2	70.5

Source URL: https://airbornescience.nasa.gov/science_reports/ARISE_-_C-130_Hercules_09_21_14_Science_Report?destination=node/24700

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Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.

141002 Flight Reports					
Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
08/24/14	Engineering Check Flight	Check	2.8	2.8	226.2
08/29/14	Boom Calibration Flight	Check	0.5	3.3	225.7
08/30/14	Project Check Flight	Check	5.2	8.5	220.5
09/01/14	Transit (1 of 2)	Transit	8.7	17.2	211.8
09/02/14	Transit (2 of 2)	Transit	6.6	23.8	205.2
09/04/14 - 09/05/14	Arctic Ocean - Flight #1	Science	6.6	30.4	198.6
09/05/14 - 09/06/14	140W Sea Ice - Flight #2	Science	7.1	37.5	191.5
09/06/14 - 09/07/14	Ice ZigZag-Terra - Flight #3	Science	7.1	44.6	184.4
09/07/14 - 09/08/14	CERES Gridbox - Flight #4	Science	8.4	53	176
09/09/14 - 09/10/14	CERES Gridbox - Flight #5	Science	7.7	60.7	168.3
09/10/14 - 09/11/14	MIZ Lawnmower - Flight #6	Science	8.8	69.5	159.5
09/11/14 - 09/12/14	CERES Gridbox - Flight #7	Science	7.5	77	152
09/13/14 - 09/14/14	CERES Gridbox - Flight #8	Science	8.3	85.3	143.7
09/15/14 - 09/16/14	CERES Gridbox - Flight #9	Science	8.1	93.4	135.6
09/16/14 - 09/17/14	Radiation Wall Pattern - Flight #10	Science	8.3	101.7	127.3
09/17/14 - 09/18/14	CERES Gridbox - Flight #11	Science	7.2	108.9	120.1

09/18/14 - 09/19/14	Sea Ice Albedo/CryoSat - Flight #12	Science	8.6	117.5	111.5
09/19/14 - 09/20/14	Radiation Wall Pattern - Flight #13	Science	8.3	125.8	103.2
09/21/14 - 09/22/14	Sea Ice & Radiation - Flight #14	Science	8.2	134	95
09/24/14 - 09/25/14	Gridbox TOA+Surface - Flight #15	Science	6.3	140.3	88.7